IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re US Appln. of : Ryutaro Kogawa

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Japanese Patent Application Filing Date : April 3, 2003

For : Mobile Communication Terminal including Non-Contact IC Card and Method of Transferring Transaction Information

VERIFICATION OF TRANSLATION

The Honorable Commissioner of Patents & Trademarks
Washington, DC 20231

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The undersigned residing at Shine Bluding 5F, 40-4, Shiba 3-chome, Minato-ku, Tokyo, Japan declares:

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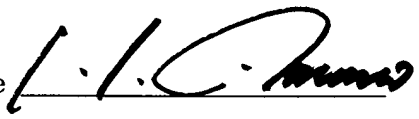
(3) that the attached English translation is a true and correct translation of the above-identified Japanese Application to the best of my knowledge and belief; and

(4) that all statements made of my own knowledge are true and that all statements made on information and belief are with the knowledge that willful false statements and the like are punishable by fine or imprisonment, or both, under 18 USC § 1001, and that such false statements may jeopardize the validity of the application or any patent issuing therefrom.

Date October 25, 2005

Signature 

Typed Name: HIROSHI AMANO

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This is to certify that the annexed is a true copy of the following application as filed with this Office.

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[Name of Attachment] Set of Drawings 1

[Name of Attachment] Abstract 1

[Number of General Power of Attorney] 9303564

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[Document Name] Specification

[Title of the Invention] Mobile communication terminal including non-contact IC, Method of transferring transaction information, and Program for doing the same.

[Claims]

[Claim 1] A mobile communication terminal including a non-contact IC card into which an external IC-card reader/writer can write transaction information, characterized in that said mobile communication terminal, when transaction information is written into said non-contact IC card, transforms said transaction information into an electric mail, and transmits said electric mail to a predetermined terminal.

[Claim 2] The mobile communication terminal as set forth in claim 1, further comprising input means for inputting a user's instructions thereinto, a user being able to indicate an address to which said electric mail is to be transmitted, through said input means.

[Claim 3] The mobile communication terminal as set forth in claim 2, wherein said address is allowed to be varied after said user is authenticated by inputting a password.

[Claim 4] The mobile communication terminal as set forth in any one of claims 1 to 3, wherein said mobile communication terminal, when said transaction information is written into said non-contact IC card, transforms said transaction information into an electric mail, and transmits said electric mail to a predetermined terminal.

[Claim 5] A method of transferring transaction information in a mobile communication terminal including a non-contact IC card into which an external IC-card reader/writer can write transaction information, including, when transaction information is written into said non-contact IC card, transforming said transaction information into an electric mail, and transmitting said electric mail to a predetermined terminal.

[Claim 6] The method as set forth in claim 5, further comprising, when a password is input into said mobile communication terminal through input means of said mobile communication terminal, checking said password, and, if said password is a right one, allowing a user to determine an address to which said electric mail is to be transmitted.

[Claim 7] The method as set forth in claim 5 or 6, further comprising, when said transaction information is written into said non-contact IC card, transforming said transaction information into an electric mail, and transmitting said electric mail to a predetermined terminal.

[Claim 8] A program for causing a computer to carry out a method of transferring transaction information in a mobile communication terminal including a non-contact IC card into which an external IC-card reader/writer can write transaction information, steps executed by said computer in accordance with said program including, when transaction information is written into said non-contact IC card, transforming said transaction information into an electric mail, and transmitting said electric mail to a predetermined terminal.

[Claim 9] The program as set forth in claim 8, wherein said steps further include, when a password is input into said mobile communication terminal through input means of said mobile communication terminal, checking said password, and, if said password is a right one, allowing a user to determine an address to which said electric mail is to be transmitted.

[Claim 10] The program as set forth in claim 8 or 9, wherein said steps further include, when said transaction information is written into said non-contact IC card, transforming said transaction information into an electric mail, and transmitting said electric mail to a predetermined terminal.

[Detailed Description of the Invention]

[0001]

[Field of the Invention]

The invention relates to a mobile communication terminal having a

non-contact IC card.

[0002]

[Prior Art]

An electronic account-settlement system including a non-contact IC card is presently practically used, for instance, in an automatic ticket-examination system in various transportation systems. In addition, an electronic account-settlement system is also being developed as a pre-paid type electronic money system for shopping, for instance. A present non-contact IC card is not designed to have a function of displaying data stored therein. Hence, a history of how a non-contact IC card is used is displayed through an IC-card reader/writer as a viewer such as a ticket-examination unit. There has been suggested a mobile communication terminal such as a cellular phone including a non-contact IC card. A history of how a non-contact IC card is used is stored in a memory and displayed through a display unit in a mobile communication terminal. That is, a mobile communication terminal acts as a viewer for viewing information stored in a non-contact IC card.

[0003]

As illustrated in FIG. 5, such a mobile communication terminal 500 including a non-contact IC card can make electronic settlement with an IC-card reader/writer 501, in which case, the IC-card reader/writer can charge electric money on the terminal, and further, can transmit transaction information 503 such as a name of a shop, an address of a shop, and a telephone number of a shop, into the terminal. Thus, transaction history of the mobile communication terminal can be stored in the mobile communication terminal 500.

[0004]

The reference 1 suggests a system in which information having been received in a certain terminal through mobile communication network is transmitted to another terminal.

[0005]

[Reference 1]

Japanese Patent Application Publication No. 2001-346259

[0006]

[Problems to be solved by the Invention]

A memory of a mobile communication terminal is used for storing a telephone directory, e-mails and various data, and hence, has just a small memory capacity for storage of a history of how a non-contact IC card has been used.

[0007]

Thus, when much history is stored in a memory, older history is deleted when newer history is stored into a memory. For instance, if a user uses a non-contact IC card as a ticket or a wallet, such history renewal is frequently carried out, resulting in that old history of how the non-contact IC card has been used is renewed at a high pace. Hence, it is preferable for a user that a memory of the cellular phone 500 has a big capacity.

[0008]

In addition, a history of how a non-contact IC card has been used is stored only in a memory of a mobile communication terminal, if a user lost his/her mobile communication terminal or a mobile communication terminal were out of order, such a history is lost, unless a user copies the history in another memory as back-up data.

[0009]

Furthermore, if a user lost his/her mobile communication terminal, he/she cannot find the mobile communication terminal, unless the mobile communication terminal has a GPS function. In particular, if a lost mobile communication terminal includes a non-contact IC card therein, the non-contact IC card may be illegally used.

[0010]

In view of the above-mentioned problems in the conventional mobile

communication terminal, it is an object of the present invention to provide a mobile communication terminal including a non-contact IC card, a method of transferring transaction information included in the mobile communication terminal, and a program for carrying out the method, all of which are capable of automatically transferring transaction information to another terminal in electronic settlement without causing a user to be aware of the transfer of transaction information.

[0011]

It is also an object of the present invention to provide a mobile communication terminal including a non-contact IC card, a method of transferring transaction information included in the mobile communication terminal, and a program for carrying out the method, all of which are capable of preventing a non-contact IC card from being illegally used by others, even if a user lost his/her mobile communication terminal.

[0012]

[Solution to the Problems]

In order to accomplish the above-mentioned objects, the present invention provides, in claim 1, a mobile communication terminal including a non-contact IC card into which an external IC-card reader/writer can write transaction information, characterized in that the mobile communication terminal, when transaction information is written into the non-contact IC card, transforms the transaction information into an electric mail, and transmits the electric mail to a predetermined terminal.

[0013]

The present invention provides, in claim 2, the mobile communication terminal as set forth in claim 1, further comprising input means for inputting a user's instructions thereinto, a user being able to indicate an address to which the electric mail is to be transmitted, through the input means.

[0014]

The present invention provides, in claim 3, the mobile communication terminal as set forth in claim 1 or 2, wherein the address is allowed to be varied after the user is authenticated by inputting a password.

[0015]

The present invention provides, in claim 4, the mobile communication terminal as set forth in any one of claims 1 to 3, wherein the mobile communication terminal, when the transaction information is written into the non-contact IC card, transforms the transaction information into an electric mail, and transmits the electric mail to a predetermined terminal.

[0016]

The present invention provides, in claim 5, a method of transferring transaction information in a mobile communication terminal including a non-contact IC card into which an external IC-card reader/writer can write transaction information, including, when transaction information is written into the non-contact IC card, transforming the transaction information into an electric mail, and transmitting the electric mail to a predetermined terminal.

[0017]

The present invention provides, in claim 6, the method as set forth in claim 5, further comprising, when a password is input into the mobile communication terminal through input means of the mobile communication terminal, checking the password, and, if the password is a right one, allowing a user to determine an address to which the electric mail is to be transmitted.

[0018]

The present invention provides, in claim 7, the method as set forth in claim 5 or 6, further comprising, when the transaction information is written into the non-contact IC card, transforming the transaction information into an electric mail, and transmitting the electric mail to a predetermined terminal.

[0019]

The present invention provides, in claim 8, a program for causing a

computer to carry out a method of transferring transaction information in a mobile communication terminal including a non-contact IC card into which an external IC-card reader/writer can write transaction information, steps executed by the computer in accordance with the program including, when transaction information is written into the non-contact IC card, transforming the transaction information into an electric mail, and transmitting the electric mail to a predetermined terminal.

[0020]

The present invention provides, in claim 9, the program as set forth in claim 8, wherein the steps further include, when a password is input into the mobile communication terminal through input means of the mobile communication terminal, checking the password, and, if the password is a right one, allowing a user to determine an address to which the electric mail is to be transmitted.

[0021]

The present invention provides, in claim 10, the program as set forth in claim 8 or 9, wherein the steps further include, when the transaction information is written into the non-contact IC card, transforming the transaction information into an electric mail, and transmitting the electric mail to a predetermined terminal.

[0022]

[Embodiments of the Invention]

The mobile communication terminal including a non-contact IC card, the method of transferring transaction information included in the mobile communication terminal, and the program for carrying out the method, all in accordance with the present invention, are explained hereinbelow with reference to drawings. Embodiments of the mobile communication terminal including a non-contact IC card, the method of transferring transaction information included in the mobile communication terminal, and the program for carrying out the

method, all in accordance with the present invention, are illustrated in FIGs. 1 to 4.

[0023]

FIG. 1 illustrates a structure of a mobile communication terminal including a non-contact IC card 101 (hereinbelow, referred to as a cellular phone 100). The cellular phone 100 includes the non-contact IC card 101 therein, and has a cellular phone unit 110 through which the cellular phone 100 can make communication with a public network such as a cellular phone network or Internet through a base station 300. Apart from the cellular phone unit 110, the cellular phone 100 has a communication interface 107 through which the non-contact IC card 101 makes communication with the cellular phone. The non-contact IC card 101 may be designed to be separate from the cellular phone 100, in which case, the non-contact IC card 101 is inserted into the cellular phone.

[0024]

The cellular phone unit 110 is comprised of an antenna 111, a modem 112, a memory 113, a display unit 114, an input/output device 115, a controller 116, a speaker 119, a microphone 120, and other units 121 such as a vibrator and LED. The controller 116 includes a CPU 117 and an external interface 118.

[0025]

The non-contact IC card 101 is comprised of a communication unit 103 which makes communication with an external IC-card reader/writer 200 through an antenna 102, a memory 104, and a controller 105. The non-contact IC card 101 can carry out electronic settlement with electronic money, and transmit data (time, shop, goods, price) about electronic settlement to the cellular phone unit 110 through the external interface 106 of the controller 105.

[0026]

It is an object of the present embodiment to provide a non-contact IC type mobile communication terminal which is comprised of a non-contact IC card

and a mobile communication terminal having a function of making data communication, and which can transfer data (shop, date/time, price, other data) about the non-contact IC card to a predetermined another terminal.

[0027]

It is an object of the present embodiment to prevent a non-contact IC card from being illegally used by others, even if a user lost his/her mobile communication terminal.

[0028]

An operation of the mobile communication terminal in electronic settlement is explained hereinbelow with reference to FIG. 2. FIG. 2 shows signals running in the cellular phone 100. Among the parts illustrated in FIG. 1, the parts not relevant to FIG. 2 are omitted.

First, a user inputs an e-mail address of a terminal (a personal computer 310 or another cellular phone 311) to which an e-mail transformed from transaction information is transmitted, through the input device 115. The e-mail address determined by a user is stored in the memory 113 as a destination address 122. The thus input e-mail address is not changed, unless a user inputs a password into the cellular phone for being authenticated as to whether he/she is really an owner of the cellular phone. In the present embodiment, since the destination address is stored in the memory of the cellular phone, an e-mail transformed from transaction information is transmitted to the destination address, even if the non-contact IC card is replaced with a new one.

[0029]

The communication unit 103 in the non-contact IC card 101 is designed to be able to make radio-signal communication with the IC-card reader/writer 200 through the antenna 102. The IC-card reader/writer makes access with an IC-card system (not illustrated) through a network, and judges whether a non-contact IC card making communication therewith is really the non-contact IC card 101, and then, charges the non-contact IC card 101 of a fee for a user's

purchase (detailed explanation is omitted, since this judgment and charge are not relevant to the present invention).

[0030]

When the IC-card reader/writer 200 makes electronic settlement, the IC-card reader/writer 200 transmits transaction information 210 such as a shop, date/time, purchased goods to the non-contact IC card 101. The non-contact IC card 101 transmits the transaction information 210 to the phone unit 110 through the interface 107.

[0031]

The transaction information 210 is stored in the memory 113 of the cellular phone unit 110, and displayed in the display unit 114. In addition, the cellular phone unit 110 transforms the transaction information 210 into an e-mail 211, and then, transmits the thus transformed e-mail 211 to the destination address 122 stored in the memory 113. The e-mail 211 is transmitted to the destination address 122 such as the personal computer 310 or the cellular phone 311 from the cellular phone unit 110 through the base station 300, a server 301 and a public network 302 (a system for transmitting an e-mail is not relevant to a mail transmitting/receiving system of a cellular phone, and hence, is not explained in detail).

[0032]

As mentioned above, the transaction information 210 is transformed into the e-mail 211 concurrently with electronic settlement, and transmitted to another terminal (the personal computer 310 or another cellular phone 311).

[0033]

FIG. 3 illustrates steps to be carried out in a conventional system, and FIG. 4 illustrates steps to be carried out in the present invention.

In the conventional system illustrated in FIG. 3, transaction information is stored in the memory of the cellular phone 100 as purchase history,

and, when a user checks the purchase history, he/she reads the purchase history out of the cellular phone 100.

[0034]

The steps to be carried out in electronic settlement in the present invention, illustrated in FIG. 4 are identical with the steps to be carried out in the conventional system. However, the present invention additionally carries out the steps of storing the transaction information about electronic settlement into a memory, transforming the transaction information into an e-mail, and transmitting the e-mail to a destination address determined in advance by a user, through a public network (300, 301).

[0035]

Thus, a user can see and check his/her purchase history through not only the cellular phone 100, but also a personal computer or another cellular phone (310, 311).

[0036]

Since a history of how a non-contact IC card has been used is stored in a limited storage area in a memory, older data is deleted when newer data is stored. However, if old data indicative of a history of how a non-contact IC card has been used is transferred to a second mobile communication terminal, a memory of the second mobile communication terminal can be used as an external memory of the first mobile communication terminal. Accordingly, a non-contact IC card of a mobile communication terminal may be designed to have a small capacity.

[0037]

Considering that transfer of a history of how a non-contact IC card in a first mobile communication terminal has been used to a memory in a second mobile communication terminal is equivalent to back-up of the history in a memory in a second mobile communication terminal, the history is automatically copied in a memory of another mobile communication terminal without

acknowledgment of a user. Hence, even if a user lost his/her mobile communication terminal or his/her mobile communication terminal became out of order, a user can keep back-up data indicative of a history of how a non-contact IC card in his/her mobile communication terminal has been used.

[0038]

An address to which an e-mail is to be transmitted from a mobile communication terminal can be varied, only when a person who tries to change an address is judged to be really a user of the mobile communication terminal. Even if the mobile communication terminal is lost or thieved, and a non-contact IC card in the mobile communication terminal is illegally used, transaction information is transmitted to an address which a user has determined. Hence, such transaction information can be used for identifying a place in which a non-contact IC card has been used. In addition, a user may be compensated for by an insurance company, based on the transaction information.

[0039]

Furthermore, when a non-contact IC card is used, an e-mail indicative of transaction information is concurrently transmitted to a predetermined address. Since the transaction information includes data indicative of a place at which a non-contact IC card has been used, it would be possible to detect a place at which a non-contact IC card has been used, without use of GPS.

[0040]

The embodiment having been explained so far is just a preferred embodiment of the present invention. It is to be understood that the subject matter encompassed by way of the present invention is not to be limited to the specific embodiment. On the contrary, it is intended for the subject matter of the invention to include all alternatives, modifications and equivalents as can be included within the spirit and scope of the following claims.

[0041]

[Advantages obtained by the Invention]

Since a history of how a non-contact IC card has been used is stored in a limited storage area in a memory, older data is deleted when newer data is stored. However, if old data indicative of a history of how a non-contact IC card has been used is transferred to a second mobile communication terminal, a memory of the second mobile communication terminal can be used as an external memory of the first mobile communication terminal. Accordingly, a non-contact IC card of a mobile communication terminal may be designed to have a small capacity.

[0042]

Considering that transfer of a history of how a non-contact IC card in a first mobile communication terminal has been used to a memory in a second mobile communication terminal is equivalent to back-up of the history in a memory in a second mobile communication terminal, the history is automatically copied in a memory of another mobile communication terminal without acknowledgment of a user. Hence, even if a user lost his/her mobile communication terminal or his/her mobile communication terminal became out of order, a user can keep back-up data indicative of a history of how a non-contact IC card in his/her mobile communication terminal has been used.

[0043]

An address to which an e-mail is to be transmitted from a mobile communication terminal can be varied, only when a person who tries to change an address is judged to be really a user of the mobile communication terminal. That is, authentication may be made as to whether a person who tries to change an address is really a user of the mobile communication terminal, before an address is changed. Even if the mobile communication terminal is lost or thieved, and a non-contact IC card in the mobile communication terminal is illegally used, transaction information is transmitted to an address which a user has determined. Hence, such transaction information can be used for identifying a place in which a non-contact IC card has been used. In addition, a

user may be compensated for by an insurance company, based on the transaction information.

[0044]

Furthermore, when a non-contact IC card is used, an e-mail indicative of transaction information is concurrently transmitted to a predetermined address. Since the transaction information includes data indicative of a place at which a non-contact IC card has been used, it would be possible to detect a place at which a non-contact IC card has been used, without use of GPS.

[Brief Description of the Drawings]

[Fig. 1]

FIG. 1 is a block diagram of a structure of the embodiment in accordance with the present invention.

[Fig. 2]

FIG. 2 shows a signal flow in the mobile communication terminal including a non-contact IC.

[Fig. 3]

FIG. 3 is a sequence chart showing steps to be carried out in the conventional system.

[Fig. 4]

FIG. 4 is a sequence chart showing steps to be carried out in the present invention.

[Fig. 5]

FIG. 5 illustrates how a conventional non-contact IC card and cellular phone are used.

[Indication by Reference Numerals]

100 Cellular phone

101 Non-contact IC card

102 Antenna

103 Communication unit

104 Memory

105 Controller

106 External interface

107 Communication interface between an IC card and a cellular phone

110 Cellular phone unit

111 Antenna

112 Modem

113 Memory

114 Display unit

115 Input device

116 Controller

117 CPU

118 External interface

119 Speaker

120 Microphone

200 IC card reader/writer

300 Cellular phone base station

301 Server

310 Personal computer

311 Cellular phone

[Title of Document] Abstract

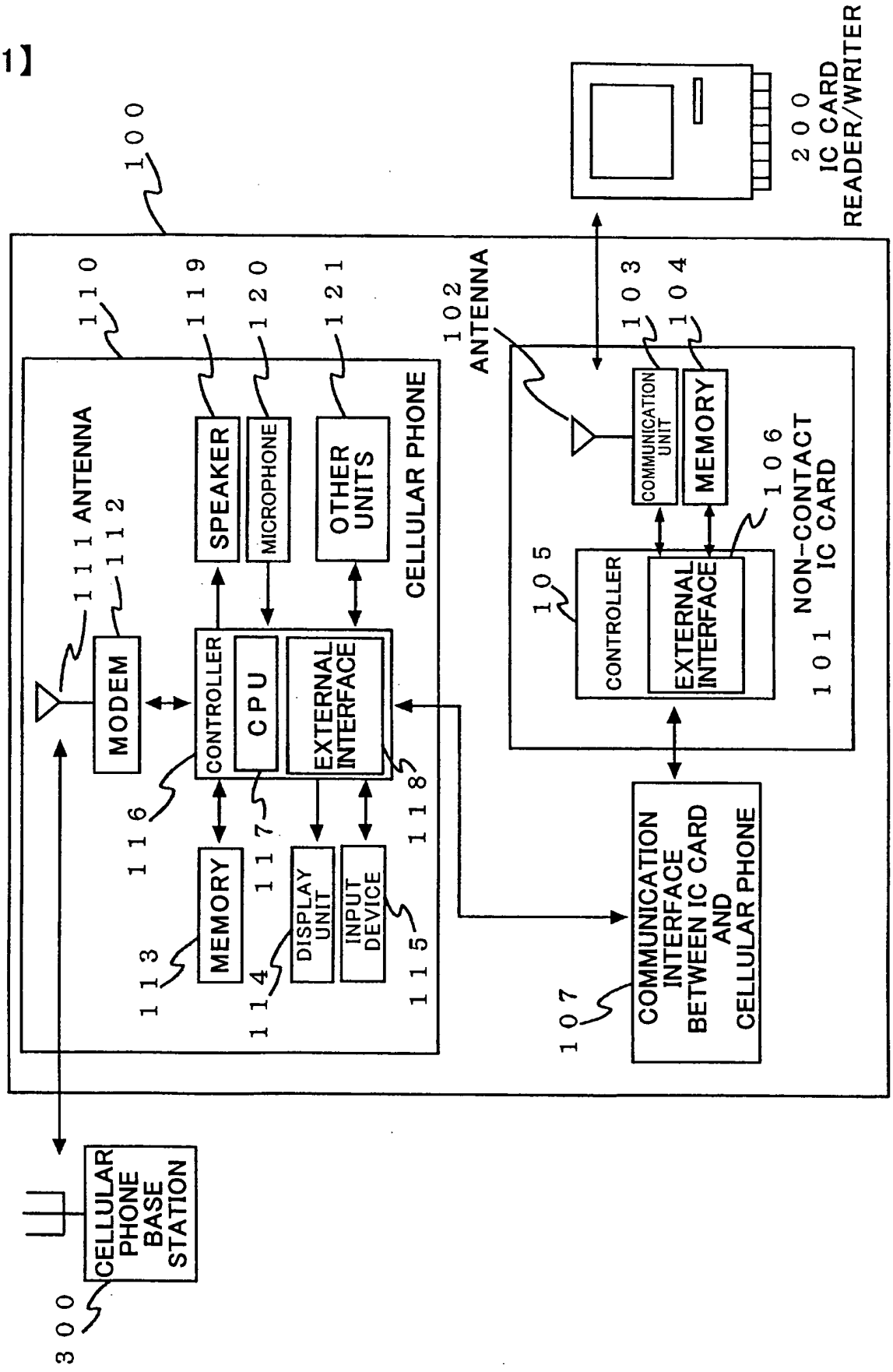
[Abstract]

[Object] To provide a mobile communication terminal including a non-contact IC card, which is capable of automatically transferring transaction information to another terminal in electronic settlement without causing a user to be aware of the transfer of transaction information.

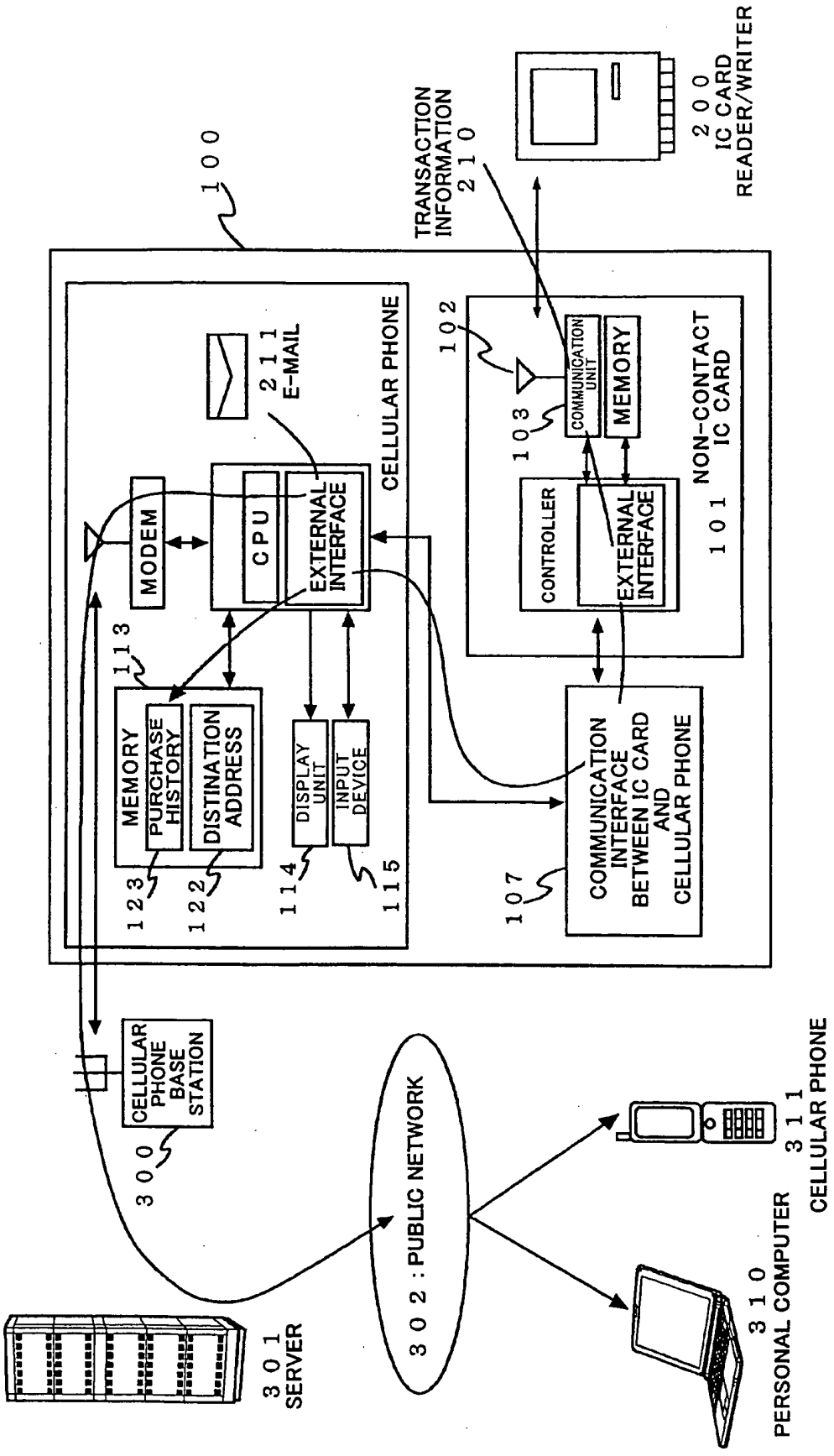
[Solution] The cellular phone 100 including a non-contact IC card 101 into which an external IC-card reader/writer can write transaction information, when transaction information is written into the non-contact IC card 101, transforms the transaction information into an electric mail, and transmits the electric mail to a predetermined terminal. Accordingly, an IC card of a memory in the cellular phone can be designed to have a small capacity.

[Selected drawing] FIG. 1

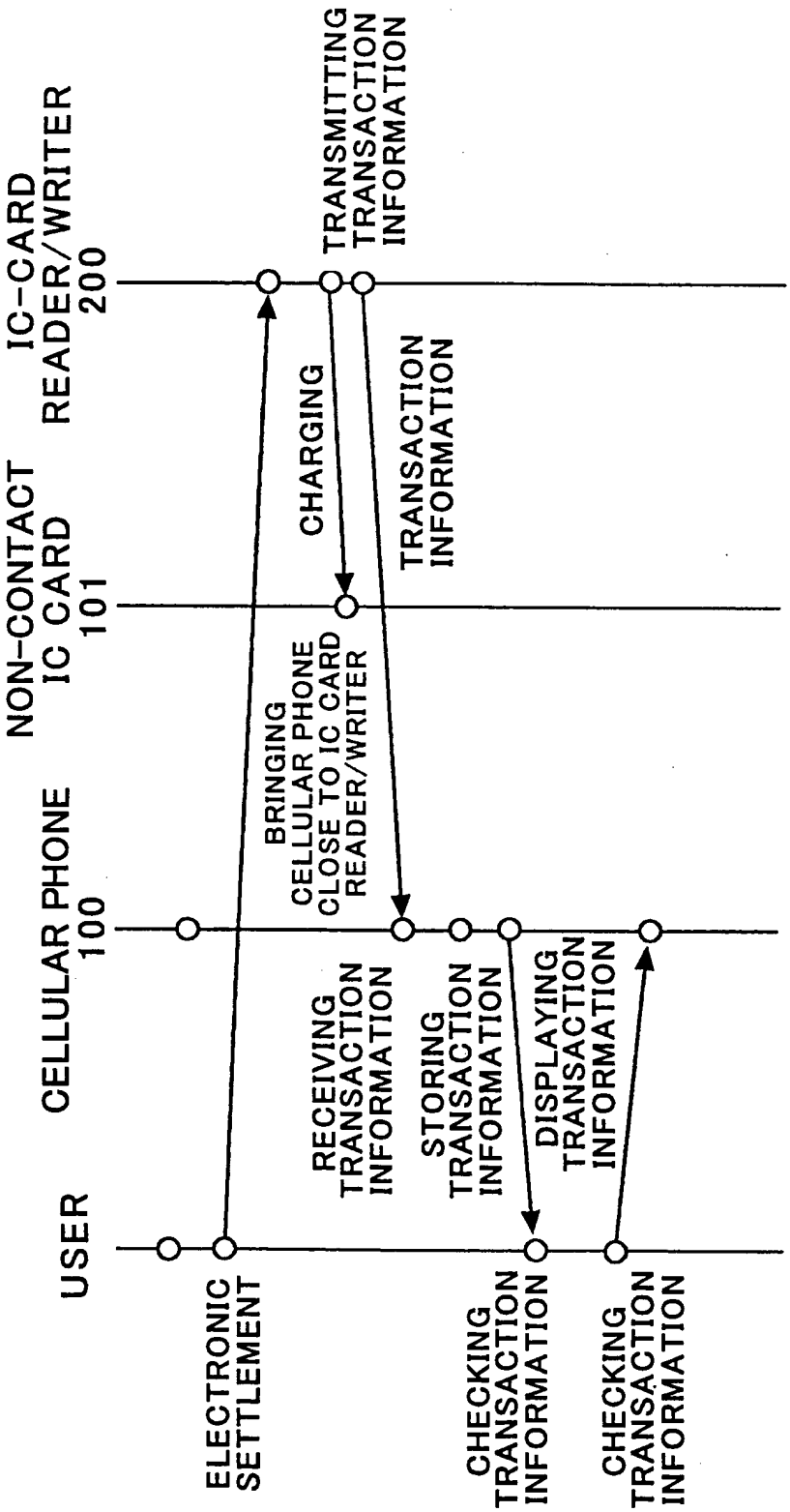
【Fig.1】



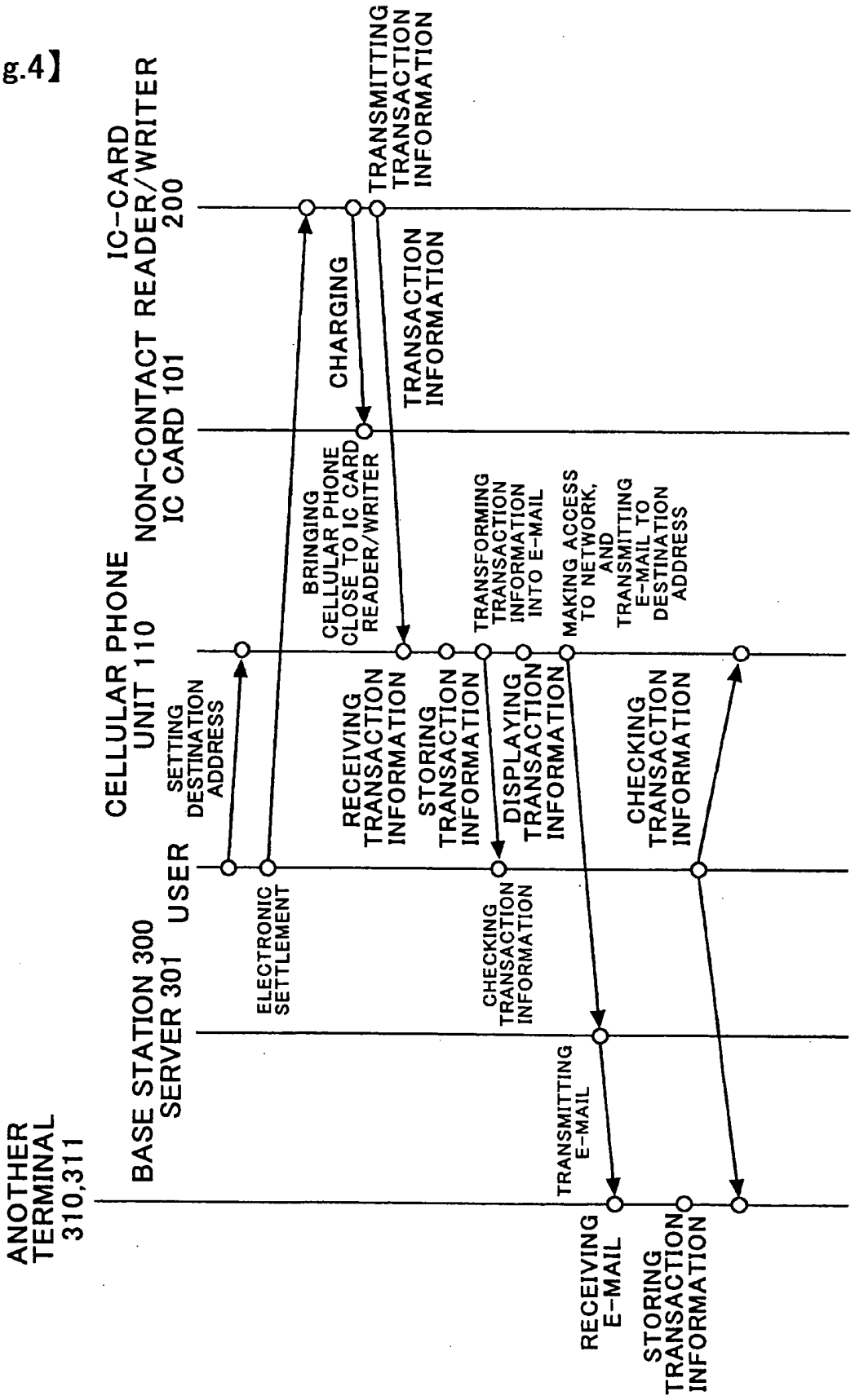
【Fig.2】


100
TRANSACTION INFORMATION 210
200 IC CARD READER/WRITER
CELLULAR PHONE
211 E-MAIL
MODEM
CPU
EXTERNAL INTERFACE
113
MEMORY
PURCHASE HISTORY
DISTINATION ADDRESS
123
122
DISPLAY UNIT
INPUT DEVICE
114
115
102
103
COMMUNICATION UNIT
MEMORY
CONTROLLER
EXTERNAL INTERFACE
101 NON-CONTACT IC CARD
107
COMMUNICATION INTERFACE BETWEEN IC CARD AND CELLULAR PHONE
CELLULAR PHONE BASE STATION
300
302 : PUBLIC NETWORK
301 SERVER
310 PERSONAL COMPUTER
311 CELLULAR PHONE

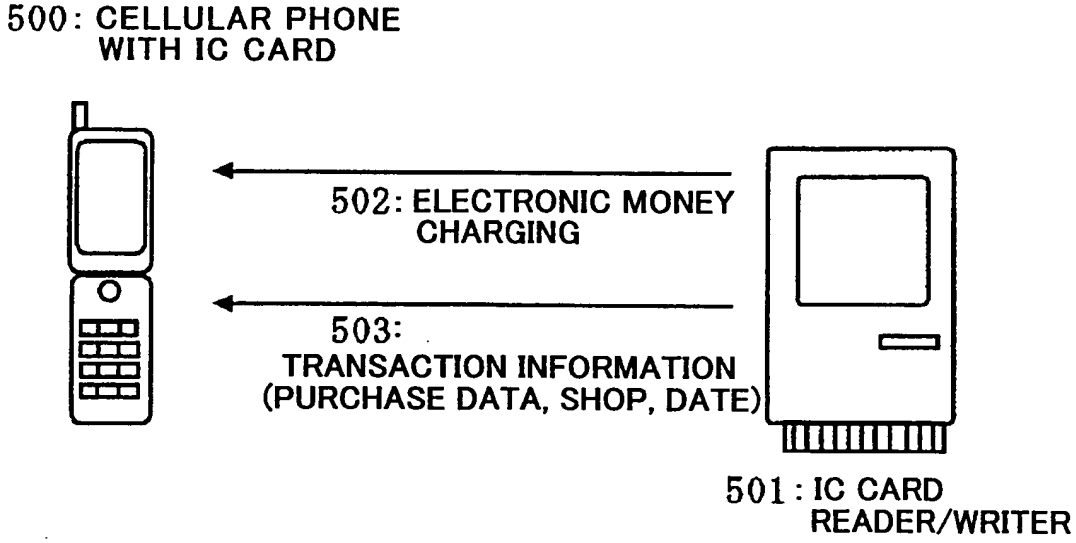
【Fig.3】


USER
CELLULAR PHONE 100
NON-CONTACT IC CARD 101
IC-CARD READER/WRITER 200
ELECTRONIC SETTLEMENT
BRINGING CELLULAR PHONE CLOSE TO IC CARD READER/WRITER
CHARGING
TRANSMITTING TRANSACTION INFORMATION
TRANSACTION INFORMATION
RECEIVING TRANSACTION INFORMATION
STORING TRANSACTION INFORMATION
DISPLAYING TRANSACTION INFORMATION
CHECKING TRANSACTION INFORMATION
CHECKING TRANSACTION INFORMATION

【Fig.4】


ANOTHER TERMINAL 310,311
BASE STATION 300 SERVER 301
USER
CELLULAR PHONE UNIT 110
NON-CONTACT IC CARD 101
IC-CARD READER/WRITER 200
SETTING DESTINATION ADDRESS
ELECTRONIC SETTLEMENT
BRINGING CELLULAR PHONE CLOSE TO IC CARD READER/WRITER
CHARGING
TRANSMITTING TRANSACTION INFORMATION
TRANSACTION INFORMATION
RECEIVING TRANSACTION INFORMATION
STORING TRANSACTION INFORMATION
CHECKING TRANSACTION INFORMATION
TRANSFORMING TRANSACTION INFORMATION INTO E-MAIL
DISPLAYING TRANSACTION INFORMATION
MAKING ACCESS TO NETWORK, AND TRANSMITTING E-MAIL TO DESTINATION ADDRESS
CHECKING TRANSACTION INFORMATION
TRANSMITTING E-MAIL
RECEIVING E-MAIL
STORING TRANSACTION INFORMATION

【Fig.5】



TRANSACTION INFORMATION	
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OBJECT	CLOTH
SUM	¥10500

TRANSACTION INFORMATION	
DATE/TIME	200X1/1/14:00
PLACE	○○ STATION
PURPOSE	FARE
SUM	¥160

503: EXAMPLE OF TRANSACTION INFORMATION